Overview of the AIRUSE LIFE+ project

Xavier Querol, IDAEA-CSIC

Athens, 15th December 2015
MEAN PM10 & PM2.5 LEVELS IN EUROPE

ESCAPE

Eeftens et al. (2012) Atmospheric Environment

Athens, 15th December 2015
PARTICULATE MATTER IN URBAN AREAS OF SOUTHERN EUROPE

Athens, 15th December 2015
### PARTICULATE MATTER AND HEALTH EFFECTS IN BARCELONA

Perez et al., 2009 ES&T

Selected results

<table>
<thead>
<tr>
<th>Fraction</th>
<th>Respiratory mortality (Lag2)</th>
<th>Cardiovascular mortality (Lag1)</th>
<th>Cerebrovascular mortality (Lag1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PM$_{10-2.5}$</td>
<td>1.033 (0.980-1.089)</td>
<td>1.059 (1.026-1.094)</td>
<td>1.098 (1.030-1.171)</td>
</tr>
<tr>
<td>PM$_{2.5-1}$</td>
<td>1.206 (1.028-1.416)</td>
<td>0.984 (0.892-1.086)</td>
<td>0.905 (0.743-1.102)</td>
</tr>
<tr>
<td>PM$_1$</td>
<td>1.010 (0.963-1.059)</td>
<td>1.028 (1.000-1.058)</td>
<td>1.063 (1.004-1.124)</td>
</tr>
</tbody>
</table>

Odds ratio per 10 ug/m3

* Athens, 15th December 2015 *
PM10 daily limit value 2012

BaP target annual value, 2012

European Environment Agency
30/11/2015

Athens, 15th December 2015
TRENDS ON NUMBER OF AQ ZONES WITH PM10 ALV DLV EXCEEDANCES

**PM10 DAILY LIMIT VALUE**

**PM10 ANNUAL LIMIT VALUE**

- Zones exceeding the LVs
- Zones between the LVs and the LV+MoT
- Zones <LVs excluding African dust
- Zones <LVs
- Non evaluated

**Number of stations**

*Athens, 15th December 2015*
<table>
<thead>
<tr>
<th>ZQA</th>
<th>Punt de mesurament</th>
<th>Tipus* d'àrea</th>
<th>Tipus** d'avaluació</th>
<th>% dades</th>
<th>Mitjana anual (ng/m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Barcelona (el Poblenou)</td>
<td>UT</td>
<td>F</td>
<td>97</td>
<td>0,14</td>
</tr>
<tr>
<td>1</td>
<td>Barcelona (Gràcia - Sant Gervasi)</td>
<td>UT</td>
<td>F</td>
<td>96</td>
<td>0,16</td>
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<tr>
<td>1</td>
<td>Barcelona (IES Goya)</td>
<td>UF</td>
<td>F</td>
<td>68</td>
<td>0,07</td>
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<tr>
<td>1</td>
<td>Barcelona (IES Verdaguer)</td>
<td>UF</td>
<td>F</td>
<td>84</td>
<td>0,11</td>
</tr>
<tr>
<td>1</td>
<td>Barcelona (l’Exemple)</td>
<td>UT</td>
<td>F</td>
<td>97</td>
<td>0,19</td>
</tr>
<tr>
<td>1</td>
<td>Barcelona (parc de la Vall d’Hebron)</td>
<td>UF</td>
<td>F</td>
<td>96</td>
<td>0,08</td>
</tr>
</tbody>
</table>

**Manlleu, BaP**

*BaP 2013, Catalonia, NE Spain*
THE AIRUSE PROJECT AIMS

• Characterizing similarities & differences in PM sources & contributions across S-EU (5 cities)
• Once the main sources of PM10 and PM2.5 are identified, the strategic goal of the AIRUSE project is to develop, test and propose specific and non specific measures to abate urban ambient air PM in S.-EU, to meet AQ standards & to approach WHO guidelines.

Specific PM mitigation measures
• Street washing & dust suppressants for road dust and deposited African dust
• Biomass burning
• Industrial emissions (channelled and fugitive)
• Strategies from other European countries (LEZ, eco-efficient vehicles, labelling, shipping, biomass burning...)
AIRUSE STRUCTURE: ACTIONS & TASKS (1/2)

**ACTION A. Preparatory actions**
- A.1 Authorities and stakeholders consultation

**ACTION B. Implementation actions**
- B1. Documentation of the current status
- B2. Harmonization and implementation of source apportionment using receptor modelling & determination of the impact of:
  - B3. Natural sources
  - B4. Biomass burning
  - B5. Industrial sources
  - B6. Traffic related sources
- B7. Developing & testing cost-effective PM measures & strategies
- B8. Applicability of selected measures from N to S Europe

**ACTION C. Implementation actions**
- C1. Effectiveness of the project actions
- C2. Assessment of the socio-economic impact

Intensive additional work on inventories, emission chemical profiles, emission factors.

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AIRUSE STRUCTURE: ACTIONS & TASKS (2/2)

ACTION D. Communication & Dissemination actions
- D1. Project website
- D2. LIFE+ Information boards
- D3. Networking-Open forum with key stakeholders
- D4. Dissemination of project results
- D5. Layman's Report

ACTION E. Project management & monitoring of the project progress
- E1. Project Management & Audit
- E2. Monitoring of the project progress
- E3. Networking with other projects
- E4. After-LIFE+ Plan

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B1: AQ TRENDS SPAIN 2001-2012

Querol et al., 2014. Science of Total Environment

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Time average map of SO$_2$ Column amount (PBL) (Dobson Units)

NASA SO$_2$ OMI level 3. Plotted using the Giovanni online data system, developed and maintained by the NASA GES DISC.

Athens, 15th December 2015
NASA NO\textsubscript{2} OMI level 3

Plotted using the Giovanni online data system, developed and maintained by the NASA GES DISC

Mean annual tropospheric NO\textsubscript{2} column (clear, 0-30\% cloud) \((10^{14}\text{ molec/cm}^2)\)
B1: AQ TRENDS SPAIN 2001-2012

Querol et al., 2014. Science of Total Environment

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B1: AQ TRENDS SPAIN 2001-2012

Querol et al., 2014. Science of Total Environment

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ANNUAL PM10 AVERAGES

FI-AGG
-34%

ATH-GAA
-32%

POR-MA
-46%

MLN-AGG
-32%

BCN-MA
-49%
90.4 PERCENTILE PM10

-29%

-45%

-29%

-29%

-49%
2003-2014 PM10 and PM1 source apportionment: Barcelona

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2003-2014 PM10 and PM1 source apportionment: Barcelona